

# Aluminium, alumina and bauxite

Resources and Energy Quarterly June 2017

## Australia's global ranking



alumina exporter



bauxite producer

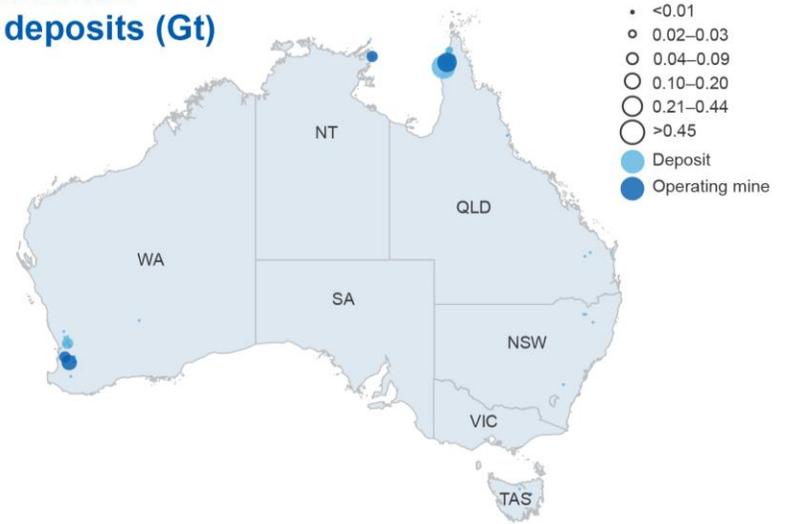


alumina producer

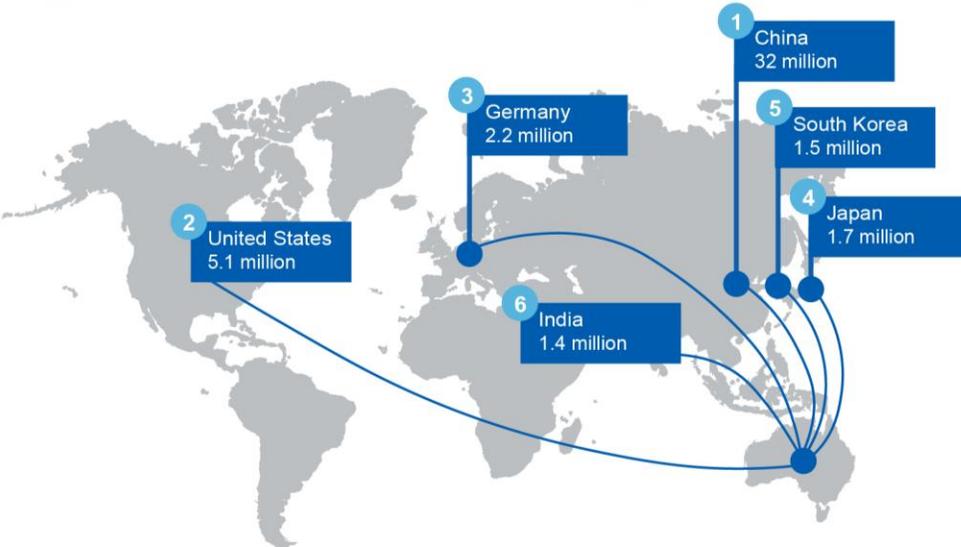
## 3 stages of producing aluminium



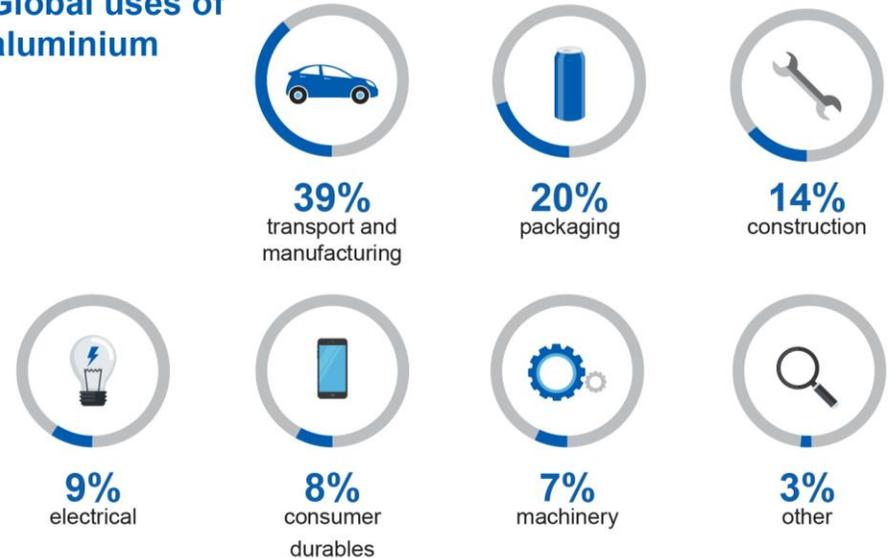
## Major Australian alumina deposits (Gt)



## Key consumer markets for aluminium (tonnes)



## Global uses of aluminium



# Aluminium

## Market summary

Australia's aluminium export earnings are estimated to have declined by 1.2 per cent to \$3.2 billion in 2016–17. Export volumes in the March quarter 2017 declined by 25 per cent year-on-year to 265,000 tonnes. The decline in volumes was attributed to a power outage at Portland Aluminium in December 2016, and to Rio Tinto's decision to cut production at its Boyne Island plant. Production in Portland was not expected to return to normal in 2016–17. Export volumes for 2016–17 are estimated to have declined by 6.2 per cent to 1.4 million tonnes. Export values were estimated to have declined by 1.2 per cent, to \$3.2 billion (2016–17 dollars).

Export volumes are expected to increase in 2017–18 and 2018–19, as the Portland Aluminium's production recovers to at least 90 per cent of pre-outage levels in 2017–18 and onwards. Over the forecast period, export volumes are forecast to return to 1.4 million tonnes a financial year. The Chinese Government's decision to both curb aluminium production in the 2017–18 winter season and remove illegal production capacity, will significantly increase aluminium prices in the second-half of 2017, and this will improve Australia's aluminium export earnings. As a result, export earnings are forecast to reach \$3.5 billion and \$3.2 billion (2016–17 dollars) in 2017–18 and 2018–19, respectively.

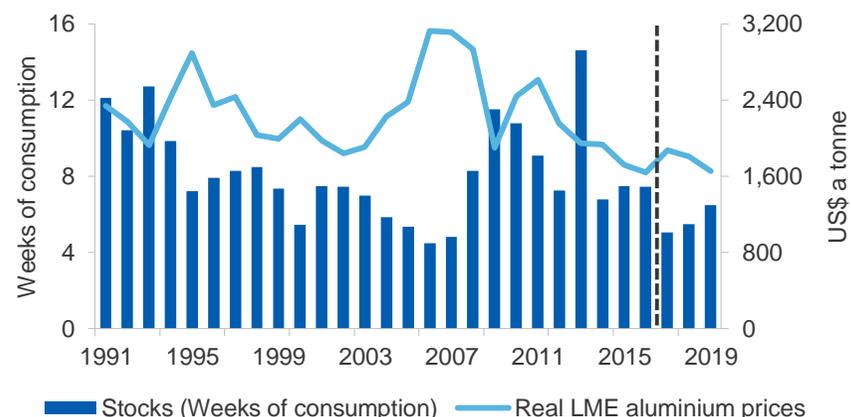
## Prices

### *Prices rise strongly in 2017, but fall modestly in 2018 and 2019*

The average London Metal Exchange (LME) spot aluminium price increased by 22 per cent year-on-year in the first six months of 2017, to average US\$1,880 a tonne. Driving the rise in prices was significant production cuts in China over the winter period — as output was reduced to curb chronic air pollution.

Possibly reflecting the Chinese production cuts, LME stocks decreased by 36 per cent from the beginning of the year to around 1.4 million tonnes in late June 2017. This trend of lower production growth and declining stocks is expected to continue over the remainder of 2017, and contribute to higher aluminium prices.

Figure 11.1: Annual aluminium prices and stocks



Source: LME (2017) spot prices; Department of Industry, Innovation and Science (2017)

For the year as a whole, aluminium prices are forecast to average 17 per cent higher than in 2016, at around US\$1,879 a tonne. World inventories of aluminium are forecast to decline by 30 per cent in 2017, to 5.8 million tonnes — or around 5.1 weeks of consumption.

It remains unclear whether Beijing's 'air pollution control' policy — which requires Chinese aluminium smelters to cut production by 30 per cent during the winter period — will be extended beyond 2017–18. Extending the policy will put upward pressure on world prices. However, increased supply from new low-cost capacity additions in China, India, Vietnam and Russia will weigh prices down. The 'committed' and 'probable' new and expansion projects that are expected to come on line in 2018 include China (capacity of 3.2 million tonnes per annum), India (330,000 tonnes), Vietnam (300,000 tonnes) and Russia (150,000 tonnes). Average LME spot aluminium prices are forecast to decline by 4 per cent in 2018 and by 8 per cent in 2019, to US\$1,807 a tonne and US\$1,657 a tonne (in real terms), respectively.

Global aluminium inventory has been revised higher from the March 2017 *Resources and Energy Quarterly* — due to data revisions since 2014 (see box below). In 'weeks of consumption', inventories are forecast to reach 5.5 weeks in 2018 and 6.5 weeks in 2019.

### Box 11.1: Aluminium prices and stocks

Prior to 2009, moves exchange stocks of aluminium provided a good indication of the net state of supply and demand for aluminium, and helped explain aluminium price movements. However, since the Global Financial Crisis, inventory moves have made the true state of the market much less clear.

Record low interest rates in the wake of the GFC saw a surge in aluminium ‘financing’, whereby metal was purchased and stored in LME warehouses, and simultaneously sold forward (at a premium) to cover (financing, rent, insurance) costs and make a guaranteed risk-free return. However, changes to LME warehousing rules in recent years — aimed at reducing the resulting ‘shortages’ brought about by LME daily load-out limits — has helped free up aluminium inventories.

Typically, when stocks (to consumption) decrease, price tends to increase, and vice versa. However, between 2014 and 2016, LME aluminium stocks fell by 23 per cent in 2014 to 4.2 million tonnes, by 31 per cent in 2015 to 2.9 million tonnes, and a by further 24 per cent in 2016 to 2.2 million tonnes. Over this period, the average real LME aluminium price *decreased* by 1 per cent in 2014 to US\$1,890 a tonne, by 11 per cent in 2015 to US\$1,686 a tonne, and a by further 3 per cent in 2016 to US\$1,640 a tonne.

Over the last three years, supply and demand estimates suggest the world aluminium market was in deficit by 106,000 tonnes in 2014, but in surplus by 498,000 and 73,000 tonnes in 2015 and 2016, respectively. The market balance thus appears to contradict the apparent (much larger) falls in global exchange stocks, and supports the thesis that aluminium inventories were simply moved off exchange.

Adding to the difficulties of monitoring inventories to interpret underlying supply and demand fundamentals, the International Aluminium Institute (IAI) ceased collecting and reporting aluminium producer inventory data at the end of 2014. Only Germany and Japan’s aluminium stocks are now reported.

To overcome the difficulties created by the under-reporting of inventories, the methodology for estimating global aluminium inventories has been revised.

The new methodology takes into consideration the end of year aluminium stock levels and the global aluminium balance (production less consumption). The new aluminium inventory calculation attempts to eliminate the issue of unreported country stocks and tries to present a more accurate reflection of global stock moves.

For example,

World aluminium inventory 2017 = World aluminium stocks 2016 + change in global market balance in 2017.

## Consumption

### *World aluminium consumption to remain strong*

World aluminium consumption increased by 8 per cent year-on-year in the first four months of 2017, to 20 million tonnes, supported by firm increases in vehicle sales. Vehicle sales in China increased by 4.2 per cent year-on-year in the first five months of 2017, to just over 11 million units, despite a Chinese Government decision to roll back the 50 per cent tax cut on small cars.

In addition to growing vehicle sales in China was the better-than-expected rises in vehicle sales from Japan (up 32 per cent), Africa and the Middle East (up 13 per cent), and India (up 7 per cent). Global vehicle sales are forecast to increase by 2.5 per cent year-on-year in the remaining three quarters of 2017, supported by a return to growth in major Emerging markets such as Argentina, Brazil and Russia.

Global industrial production — a significant driver of commodity demand — is forecast to increase by 2.9 per cent in 2017. As a result, world aluminium consumption is forecast to grow by 2.9 per cent in 2017 to 60 million tonnes.

World aluminium consumption is forecast to rise at an average annual rate of 2.8 per cent over the next two years, to 62 million and 63 million tonnes, respectively. Consumption growth is likely to track trends in global industrial production, which is forecast to grow by 3.0 per cent and 2.5 per cent in 2017 and 2018, respectively. The transport sector is projected to be the key driver of growth in aluminium usage, supported by increased vehicle sales and higher aluminium intensity in the production of trains and new vehicles.

Global vehicle sales are expected to increase by 4.0 per cent and 3.2 per cent in 2018 and 2019, respectively, led by projected rises in vehicle sales in major and emerging automotive markets (such as North America, China, and Latin America). In China, growth in vehicle sales is estimated to fall from the double-digit growth rate recorded in 2016. Aluminium demand from North America is expected to rise at an annual average rate of over 3 per cent over the next few years, to 7.5 million tonnes in 2019, buoyed by stronger motor vehicle production. Latin America is expected to be the fastest growing regional automotive market in the world, due to more stable currencies in Brazil and Argentina, and to stronger economic growth in other countries in the Latin American region.

Global automotive makers are increasingly using aluminium to reduce vehicle weights and curb emissions. It is estimated that a reduction of 100 kilograms in weight in a vehicle translates to about 0.6 litres less fuel usage per 100 kilometres distance travelled. Aluminium alloy replaces steel with equivalent functionality at only half of its weight.

Aluminium use in the manufacture of trains — currently responsible for around 1 million tonnes of aluminium alloy demand — is forecast to increase in the next few years. In particular, the market for high-speed trains is growing at an annual rate 5 per cent.

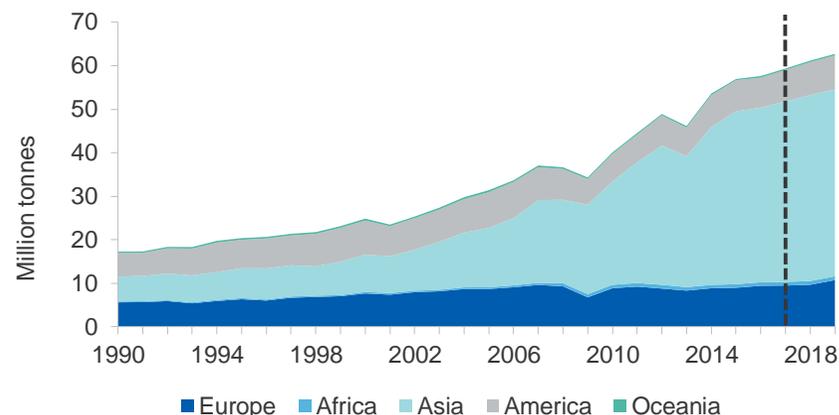
## Production

### *Production to fall in 2017, but will resume growing in 2018 and 2019*

World aluminium production increased by 7 per cent year-on-year in the first five months of 2017, to 25 million tonnes, driven by a strong growth (up 11 per cent year-on-year) in China. Chinese producers ramped up output sharply after winter production restrictions ended. Partially offsetting the rise in Chinese output was a decline in aluminium output in Oceania (down by 13 per cent year-on-year), and America (down by 2.5 per cent). The large fall in Oceania production in the March quarter 2017 was due to production cutbacks at Portland Aluminium in Australia.

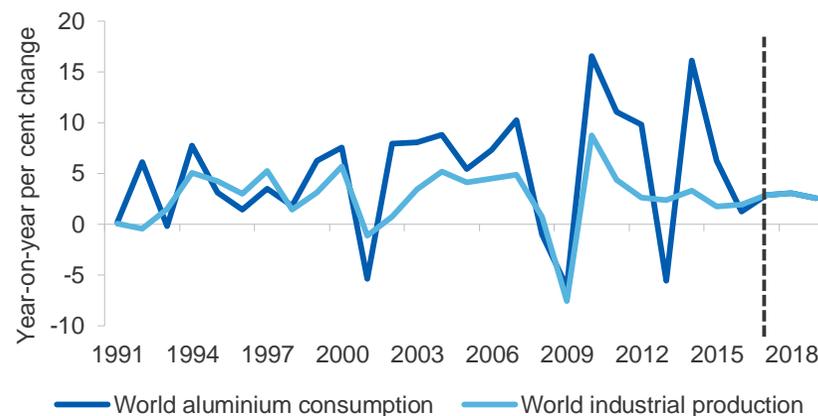
The Chinese authorities have taken aggressive steps to address air pollution and excess capacity issues in China. The ‘air pollution control’ policy requires Chinese aluminium smelters to cut aluminium output by 30 per cent over the 2017–18 winter period, and a clamp-down on ‘illegal aluminium capacity’ is to be carried out until the end of 2017.

**Figure 11.2: World aluminium consumption**



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

**Figure 11.3: Aluminium usage and industrial production, growth**



Source: CPD Netherlands Bureau for Economic Policy Analysis; Department of Industry, Innovation and Science (2017); World Bureau of Metal Statistics (2017)

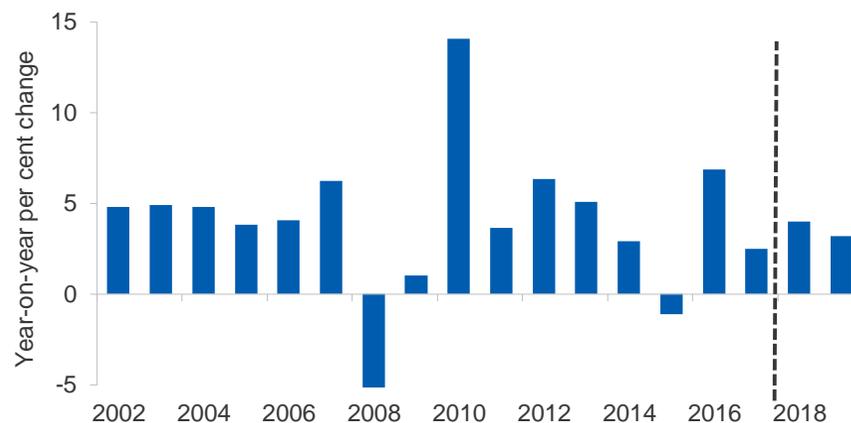
‘Illegal capacity’ includes facilities that did not obtain all necessary approvals from the central government — including the national industry restructuring guidance — and did not meet aluminium industry standards and environmental protection requirements. It is estimated that illegal aluminium capacity in China totals around 6.6 million tonnes. The large majority (around two thirds, or 4.3 million tonnes) of China’s illegal capacity is situated in Shandong Province. It is expected that government inspection teams will report back to the central government in October 2017, and further production cuts are anticipated over the remainder of the year.

The crack down on air pollution and ‘illegal capacity’ is expected to reduce China’s aluminium production by 7 per cent in 2017 to 29 million tonnes. However, offsetting China’s production cut is the impact of expected rises in ex-China Asian countries (up 20 per cent) and the Middle East (up 2 per cent). As a result, the world aluminium production is forecast to fall by just 1.6 per cent in 2017, to 57 million tonnes.

Global aluminium production is projected to resume growing in 2018 and 2019. Output should reach 64 million tonnes by 2019, driven by increased capacity in China and other ex-China Asian countries. China will add new aluminium smelting capacity that is more efficient and friendly to the environment than the old plants being forcibly retired. A forecast increase in aluminium prices in 2017 will encourage Chinese smelters to increase output rates, particularly from those operators facing production cuts in the 2017–18 winter season. Despite Chinese local and central governments’ attempt to reduce excess capacity, China’s production is forecast to grow by 8 per cent and 3 per cent in 2018 and 2019, to 33 and 35 million tonnes, respectively.

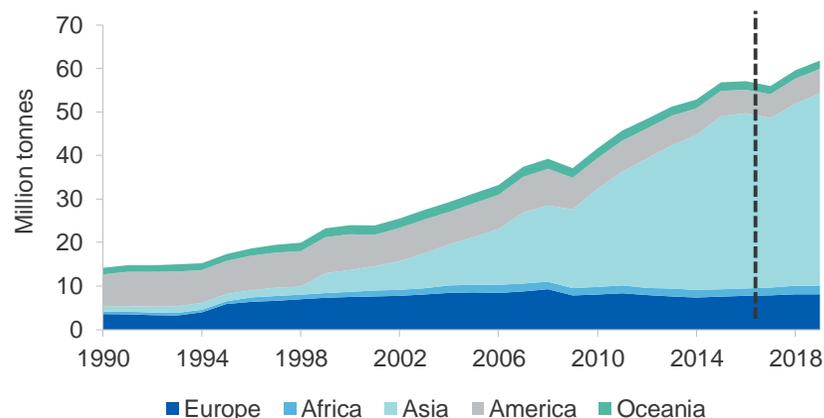
There is still uncertainty over whether or not the ‘air pollution policy’ and ‘illegal capacity policy’ being implemented by the Chinese authorities will be extended after the 2017–18 winter season. There have been were similar polices in the past, but they failed to curb excess capacity. From similar current crackdowns on steel production, it appears that Beijing is more determined this time around. Production data will eventually help reveal whether the air pollution and illegal capacity control policies have succeeded.

**Figure 11.4: Growth in global vehicle sales**



Source: *Business Monitor International (2017); Department of Industry, Innovation and Science (2017)*

**Figure 11.5: World aluminium production**



Source: *International Aluminium Institute (2017); Department of Industry, Innovation and Science (2017)*

## Australia's production and exports

### Production to fall sharply in 2017

In the March quarter 2017, Australia's aluminium production decreased by 13 per cent to 348,000 tonnes, due to reduced capacity at the Portland smelter (following a power outage in December 2016). Over this period, Portland's quarterly production was 23,000 tonnes, around 40 per cent of pre-outage levels. Production at Boyne Island fell by 6.8 per cent year-on-year in the March quarter of 2017 to 135,000 tonnes, as Rio Tinto decided to lower output in response to higher power prices. For 2016–17 as a whole, Australia's aluminium production is estimated to fall by 6.8 per cent to 1.5 million tonnes. Portland Aluminium's pre-outage production levels are not expected to be restored until August 2017.

Production at the Portland smelter is expected to be at least 90 per cent of pre-outage levels in 2017–18 and onwards, at around 264,000 tonnes a year. It is unlikely that the Boyne Island smelter will return to full production soon, due to an ongoing high power prices. As a result, Australia's aluminium production for the next two financial years is forecast to remain at around 1.6 million tonnes.

Energy security and supply issues in Australia are expected to be an ongoing concern for Australian aluminium smelters. The Finkel Review (officially the Independent Review into the Future Security) of the National Electricity Market) recommends action to create a reliable and affordable energy system in Australia, and provides a way forward for energy policy at a national level. The Tomago aluminium smelter has expressed interest in purchasing coal-fired electricity from any potential supplier in the Hunter Valley. This will boost the chance of a new power plant being built in the region, which will in turn contribute to the stability of the region's power supply. Any supply or demand shocks to electricity prices would have adverse impacts on aluminium production in Australia. Rio Tinto's decision to curtail the output of its Boyne Island smelter in 2017 highlights the seriousness of power price issue. Rising power prices have the potential to undermine the sustainability of the Australian aluminium industry.

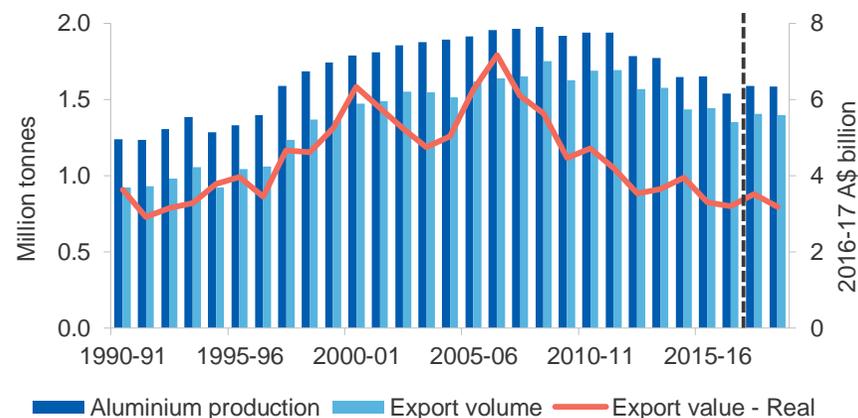
### Capacity constraint hinders export opportunities

Australia's aluminium export earnings declined by 18 per cent year-on-year to \$650 million in the March quarter 2017, reflecting a decline in export volumes (down 25 per cent to 265,000 tonnes). As a result, the estimate for Australia's aluminium export values and volumes for 2016–17 has been revised down by 5 per cent and 2.7 per cent, to \$3.2 billion and 1.4 million tonnes, respectively.

In 2017–18, Australia's aluminium export volumes and values are forecast to rise by 4.1 and 10 per cent, respectively, to 1.4 million tonnes and \$3.5 billion (2016–17 dollars), driven by an expected increase in production at Portland Aluminium, and higher aluminium prices in the first half of 2017–18. The Chinese Government's decision to curb aluminium production in the 2017–18 winter season will increase aluminium prices in the second-half of 2017, and this is expected to support increased earnings for Australian aluminium exports.

Australia's aluminium exports for 2018–19 are forecast to remain steady, at 1.4 million tonnes. However, export values are forecast to fall by 10 per cent to \$3.2 billion (2016–17 dollars), because of a projected fall in aluminium prices in 2018 and 2019.

**Figure 11.6: Australia's aluminium production and exports**



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

# Alumina

## Market summary

Australia's alumina export earnings are estimated to have increased by 3.6 per cent in 2016–17 to \$6.3 billion, supported by a strong growth in alumina prices in the first three months of 2017. However, export values are forecast to fall by 5.5 per cent in 2017–18 and by 1.6 per cent in 2018–19, to \$5.8 billion (2016–17 dollars), because of a forecast decrease in alumina prices. Export volumes are estimated to have increased by 1.5 per cent in 2016–17, to 18 million tonnes, and are forecast to rise modestly (by an average 0.8 per cent a year) in 2017–18 and 2018–19, supported by production cuts in China.

## Prices

*Alumina prices forecast to grow strongly in 2017, but come under pressure in 2018 and 2019*

The average FOB Australia alumina price increased by 34 per cent year-on-year in the first six months of 2017, to average US\$318 a tonne, driven by the expectation of Chinese production cuts. The change in regulatory policies in China — where refineries have been asked to cut production by 30 per cent during the 2017–18 winter season, and undergo an illegal capacity investigation until the end of 2017 — is likely to push up alumina prices in 2017. As a result, the average FOB Australia alumina price is forecast to rise by 28 per cent in 2017, to average \$US332 a tonne.

Further out, FOB Australia alumina prices are forecast to come under pressure, falling by 4.1 per cent and 5.8 per cent in 2018 and 2019, to \$US318 a tonne and \$US300 a tonne, respectively. New capacity additions in China and other major producing countries, are expected to put downward pressure on prices. It is projected that China will add over 6.8 million of refinery capacity in 2018, from greenfield and expansion projects. In particular, industrial heavyweights Shandong and Shanxi are forecast to add 2.0 million tonnes and 1.8 million tonnes per annum, respectively, to the country's alumina capacity by 2018. Outside of China, India and the UAE are projected to add another 3 million tonnes of new refinery capacity in 2018.

Figure 11.7: Annual alumina price



Source: Bloomberg (2017) alumina monthly price; Department of Industry, Innovation and Science (2017)

## Consumption

*Modest growth in alumina consumption in 2018 and 2019*

In the five months of 2017, world alumina consumption increased by 7 per cent year-on-year, to 44 million tonnes, because of stronger demand from aluminium smelters. In China — the world's largest alumina consumer — alumina consumption increased by 11 per cent year-on-year, to 23 million tonnes, in line with the rise in China's aluminium production.

In Australia, alumina consumption declined by 13 per cent year-on-year in the March quarter, affected by reduced production capacity in Portland Aluminium following the power outage in December 2016. Alumina consumption in America and Europe moved in the same direction, down 2.5 and 1.2 per cent over the first five months of 2017, respectively. For 2017 as a whole, global consumption of alumina is expected to decline by 1.1 per cent to nearly 109 million tonnes, because of production cut in China over the 2017–18 winter period.

## Production

### *Alumina production to fall in 2017, but return to grow in 2018 and 2019*

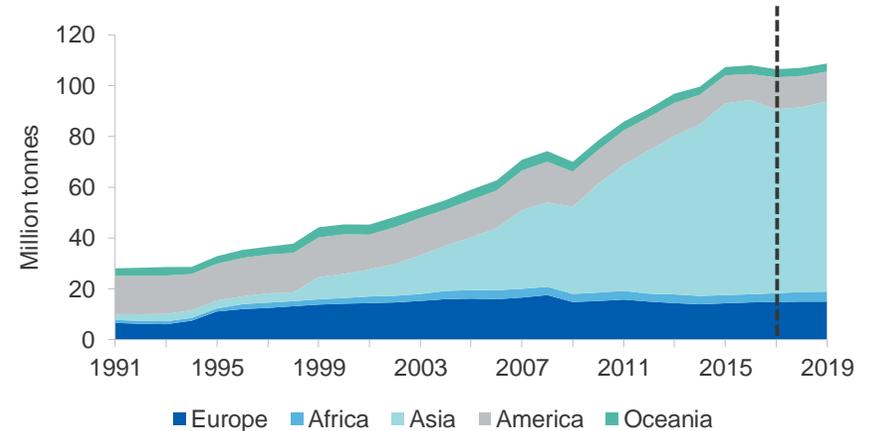
World alumina production increased by 17 per cent year-on-year in the first five months of 2017, to nearly 54 million tonnes, mainly driven by increased production in China (the world's largest alumina producer). The rise in Chinese production reflected Chinese refineries' strategy to maximise output ahead of production cuts in the 2017–18 winter season. In addition, there were several new refining capacity start-ups during the March quarter 2017, including the Chalco Zhengzhou and the East Hope Jinzhong refineries, both of one million tonnes. Outside of China, output in Europe rose by 2.5 per cent year-on-year in the first five months of 2017, to 4.3 million tonnes. However, North American alumina output fell by 32 per cent year-on-year in the first five months of 2017, to about 1.3 million tonnes, as US refineries decided not to raise production until they know the outcome of the ongoing anti-dumping cases against China.

For 2017 as a whole, global alumina production is forecast to fall by 8 per cent to 106 million tonnes, largely due to production cuts in China. This is a larger than expected decline than the previous forecast, reflecting the larger impact of the Chinese and US government's policies on their country's alumina refineries — expected to more than offset the impact of the delay of new projects in other Asian (ex-China) countries.

China's 'air pollution control' control policy, and the 'illegal capacity' crackdown, are forecast to reduce that country's alumina production by 15 per cent in 2017, to 52 million tonnes. US alumina refineries are unlikely to boost their output for the remainder of 2017, pending the Trump Administration's decision on imported Chinese aluminium. In India, the 1.6 million tonnes a year Lanjigarh refinery expansion project is not likely to be operational in 2017, because of poor bauxite availability. In Indonesia, the 1 million tonnes a year Shandong Nanshan Bintan Island and 2 million tonnes a year Mempawah refinery projects, are expected to be delayed into 2018–19.

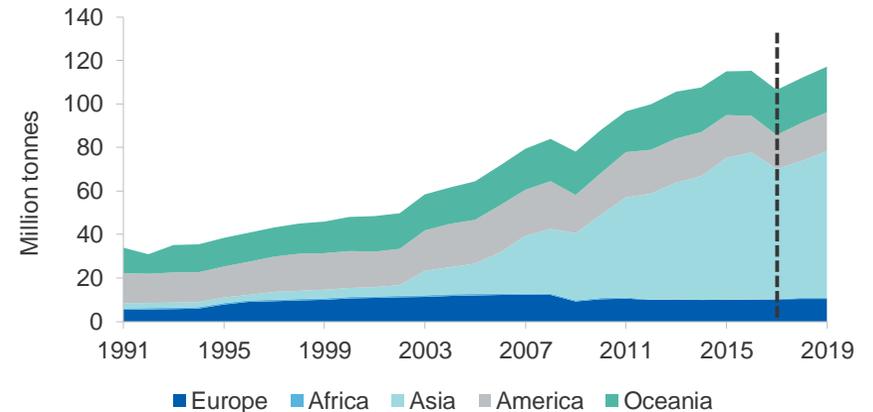
In 2018 and 2019, world alumina production is projected to resume growing at an annual rate of 5 per cent, reaching 117 million tonnes by 2019. There is no indication yet that the Chinese Government will continue requesting alumina refineries to curb production — thereby reducing air pollution — in winter seasons from 2018 onwards.

**Figure 11.8: World alumina consumption**



Source: AME Group (2017); Department of Industry, Innovation and Science (2017); World Bureau of Metals Statistics (2017)

**Figure 11.9: World alumina production**



Source: International Aluminium Institute (2017); Department of Industry, Innovation and Science (2017)

China's alumina production is forecast to increase by 2.0 per cent and 3.6 per cent in 2018 and 2019, to 52 and 54 million tonnes, respectively.

Production in North America is forecast to rise in 2018 and 2019, up by 12 per cent and 2.2 per cent to 17.5 million tonnes and 17.9 million tonnes, respectively, on the assumption that anti-dumping issues will be resolved. Global alumina production over this forecast period is expected to be impacted by delays to the 1.5 million tonnes a year Al Taweelah Alumina project in the UAE, and the 1.6 million tonnes a year Alpart Alumina project in Jamaica.

## Australia's production and exports

### *Australia's alumina production to remain steady*

In the March quarter 2017, Australia's alumina production decreased by 2.8 per cent from the December quarter 2016, to 5.1 million tonnes, due to reduced output from Rio Tinto's Queensland Alumina Limited (QAL) refineries. Cyclone Debbie reached the northern Queensland region at the end of March, and disrupted the operation and production of the QAL for a number of days. Production is expected to have risen by 1.8 per cent in the last quarter of 2016–17, supported by a return to normal production capacity at the Gladstone refineries. As a result, Australia's alumina production is forecast to have increased by 0.4 per cent in 2016–17, to nearly 21 million tonnes.

Going forward, alumina production in Australia is forecast to be little changed, at about 21 million tonnes in 2017–18 and 2018–19, with no planned closures/expansions or major disruptions at existing operations.

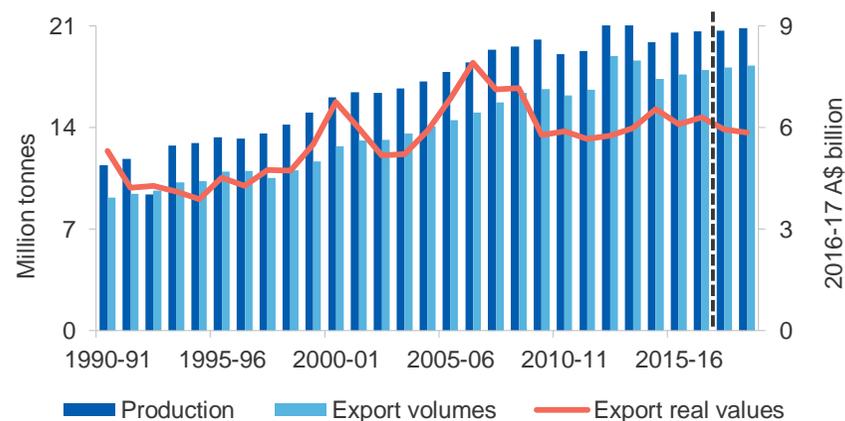
### *Exports to rise modestly*

In the March quarter 2017, Australia's alumina export earnings rose by 19 per cent year-on-year to \$1.9 billion. The result came as higher prices more than outweighed the impact of lower export volumes. The expected return to normal production capacity in the Queensland Alumina refineries in the fourth quarter of 2016–17, will boost Australia's alumina exports. Export volumes and values are estimated to have increased by 1.9 per cent and 3.6 per cent in 2016–17, to 18 million tonnes and \$6.3 billion (2016–17 dollars), respectively. Export earnings have been revised up by 7 per cent since the March 2017 *Resources and Energy Quarterly*, driven by strong growth in alumina prices since the beginning of the year.

In 2017–18 and 2018–19, there will be emerging opportunities and challenges for Australia's alumina exports. The projected increase in aluminium production in China and the Middle East over the next two years is expected to boost the demand for alumina. As a result, Australia's alumina exports are forecast to increase at an annual rate of 0.8 per cent, reaching 18.3 million tonnes in 2018–19. However, export earnings are forecast to fall at an annual rate of 3.8 per cent to \$5.8 billion (2016–17 dollars) by 2018–19, because of a likely decline in alumina prices.

There are risks to the outlook. Firstly, alumina exports are likely to be constrained by production capacity limits, with no major additions scheduled until 2018–19. Secondly, new capacity additions from China and elsewhere will come on line, with an estimate of 19 million tonnes a year of additional capacity. Thirdly, the rise of India as a potential supplier of alumina to China will intensify the competition for sales of alumina to China. India's share of China's total alumina imports increased from 5.0 per cent in the December quarter 2016, to 13 per cent in the March quarter 2017.

**Figure 11.10: Australia's alumina production and exports**



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

# Bauxite

## Market summary

The outlook for Australia's bauxite exports is positive, but there are short term challenges because of regulatory changes in China. The 'air pollution control' policy and the clamp-down on 'illegal capacity' in China are likely to have a profound impact on Australian bauxite exports in 2017. As a result, export volumes and values are forecast to fall by 2 and 7 per cent in 2017–18, to 23 million tonnes and \$921 million (2016–17 dollars), respectively. However, the prospects for Australia's bauxite exports are brighter in 2018–19, driven by the growth in China's alumina production. Export volumes and earnings are forecast to grow by 19 and 6 per cent, to 28 million tonnes and \$977 million (2016–17 dollars), respectively.

## Production

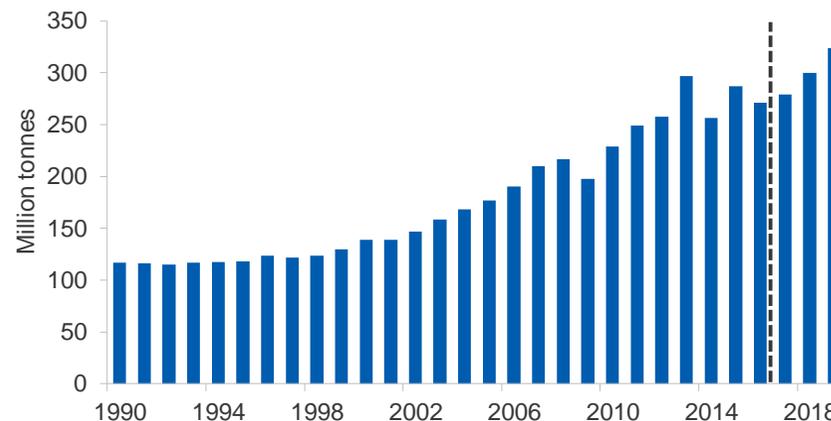
### *World bauxite production to rise strongly in 2018 and 2019*

In the first four months of 2017, world bauxite production remained unchanged year-on-year, at 92 million tonnes, as production in Australia and China — the world's largest and 2nd largest bauxite producers, respectively — remained unchanged at nearly 28 and 22 million tonnes, respectively. For 2017 as a whole, Chinese bauxite production is estimated to fall by 7 per cent to around 61 million tonnes, due to curtailed alumina production in the 2017–18 winter season. Offsetting the fall in Chinese production is the rise in Australia's bauxite output (estimated increase of 1.5 per cent), Africa (up 30 per cent), and South America (up 1.8 per cent). As a result, world bauxite production is estimated to rise by 2.8 per cent to around 279 million tonnes.

World bauxite production is forecast to rise by 7 per cent and 8 per cent in 2018 and 2019, to 300 and 324 million tonnes, respectively, primarily driven by new capacity additions in Australia. With the addition of Metro Mining's Bauxite Hills project in 2018, and Rio Tinto's Amrun project in 2019, Australian bauxite output is forecast to increase at annual rate of at least 6 per cent, to 92 million tonnes by 2018–19.

China's bauxite production is unlikely to rise significantly over the next two years, as the declining quality of domestic bauxite and the depletion of resources in China deter future investment. China's bauxite imports

Figure 11.11: World bauxite production



Source: World Bureau of Metal Statistics (2017); Department of Industry, Innovation and Science (2017)

rose by 47% year-on-year in May, taking the January–May 2017 rise on the corresponding period in 2016 to 15%. Other contributors to increased global bauxite production include Guinea, Malaysia and Indonesia. In Malaysia, the government imposed a complete mining ban at the start of 2016, in order to limit supply growth and address socio-environmental concerns. The ban has been extended four times, and is expected to be lifted at the beginning the September quarter 2017. In Indonesia, the government recently lifted the ban on bauxite exports that had been implemented from 2014 to 2016. The removal of the export ban is likely to be a stimulus for increased bauxite production in Indonesia and the world as a whole.

The risk to the global bauxite production forecast comes from energy and environmental concerns in Guinea. It was claimed by the protestors in the city of Boko — a key bauxite mining area in Guinea — that bauxite mining activities are the cause of high pollution levels and electricity shortages in the nation. Any disruption to the country's bauxite operations is likely to have a significant impact on global bauxite output.

## Australia's production and exports

### Australia's bauxite production escalates in 2019

In the March quarter 2017, Australia's bauxite production increased by 2 per cent year-on-year to around 21 million tonnes, with two out of three bauxite producers recording a rise in production. Production at Rio Tinto's Gove and Weipa mines in the Northern Territory and Queensland increased by 8 per cent and 6 per cent year-on-year, to 2.4 million tonnes and nearly 7 million tonnes, respectively. However, production at South 32's Worsley mine in the Western Australia was down by 1.1 per cent year-on-year to more than 11 million tonnes. For the remainder of 2016–17, there were no scheduled additions or disruptions to existing operations. As a result, Australia's bauxite production is estimated to have increased by 1.5 per cent to 83 million tonnes.

Australia's bauxite production growth is expected to accelerate in 2018–19, buoyed by the commissioning of the 5 million tonnes a year Metro Mining's Bauxite Hills project in the June quarter 2018, and the 23 million tonnes a year Rio Tinto's Amrun project in the March quarter 2019. These new additions will increase Australian bauxite output by 1.2 per cent and 10 per cent in 2017–18 and 2018–19, to 84 million tonnes and 93 million tonnes, respectively. The risk to this forecast rests in the energy supply issues that Australia is currently facing: rising power costs will have a considerable impact on operational costs and profitability.

### Exports to be affected by regulatory changes in China

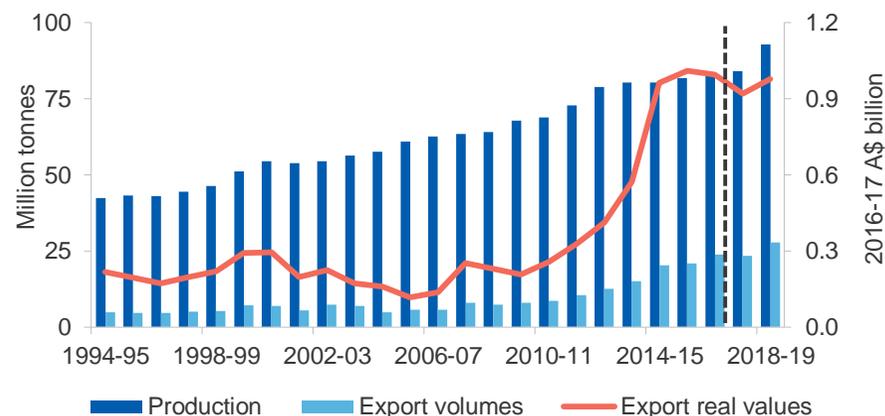
Australia's bauxite export earnings increased by 2 per cent year-on-year in the March quarter 2017 to \$233 million, driven by an 8 per cent year-on-year rise in bauxite export volumes to China to 5.5 million tonnes. For 2016–17 as a whole, export volumes are estimated to have increased by 14 per cent, to nearly 24 million tonnes. However, export values are estimated to have fallen by 1.5 per cent to \$994 million, because of lower bauxite prices.

The Chinese Government's air pollution controls and its clamp down on illegal capacity are likely to have a larger impact on Australia's bauxite exports in 2017–18 than previously estimated. Export volumes and earnings have been revised down by 7 per cent and 14 per cent, to 23 million tonnes and \$921 million (2016–17 dollars), respectively.

The outlook for Australian bauxite exports is brighter in 2018–19, with export volumes and values forecast to grow by 19 per cent and 6 per cent, to nearly 28 million tonnes and \$977 million (2016–17 dollars), respectively. An expected rise in alumina production in China will drive the increased Australian bauxite exports.

The risk to the Australian bauxite production outlook will come from increased competition from newly-emerging bauxite exporters. For example, in April 2017, Fiji made its first shipment of bauxite in the first week of April 2017, exporting 70,000 tonnes of bauxite to China. The Republic of Fiji is home to the Vanua Levu mine, one of the largest bauxite mines in Oceania, with an estimated reserve of 1 billion tonnes. Furthermore, the Emirates Global Aluminium Company of the UAE has recently opened a representative office in Shanghai, China, to promote the sales of bauxite from its joint-venture Guinea bauxite mine, Guinea Alumina Corporation (GAC). The GAC bauxite project is expected to commence production in 2018, with an annual capacity of 12 million tonnes a year.

Figure 11.12: Australia's bauxite production and exports



Source: ABS (2017) *International Trade in Goods and Services*, 5368.0; Department of Industry, Innovation and Science (2017)

**Table 11.1: Aluminium, alumina and bauxite outlook**

World	Unit	2016	2017 f	2018 f	2019 f	Annual percentage change		
						2017 f	2018 f	2019 f
Primary aluminium								
Production	kt	58,158	57,222	62,177	64,480	-1.6	8.7	3.7
Consumption	kt	58,085	59,744	61,548	63,092	2.9	3.0	2.5
Closing stocks b	kt	2,762	2,705	2,651	2,598	-2.0	-2.0	-2.0
– weeks of consumption		7.5	5.1	5.5	6.5	-32.2	7.5	18.5
Prices aluminium c								
– nominal	US\$/t	1,604	1,879	1,851	1,736	17.1	-1.5	-6.2
– real d	US\$/t	1,640	1,879	1,807	1,657	14.6	-3.8	-8.3
Prices alumina spot								
– nominal	US\$/t	253.2	331.8	325.8	314.1	31.0	-1.8	-3.6
– real d	US\$/t	258.9	331.8	318.2	299.8	28.2	-4.1	-5.8
Australia	Unit	2015–16	2016–17 s	2017–18 f	2018–19 f	2016–17 s	2017–18 f	2018–19 f
Production								
Primary aluminium	kt	1,649	1,536	1,589	1,586	-6.8	3.4	-0.2
Alumina	kt	20,550	20,641	20,680	20,834	0.4	0.2	0.7
Bauxite	Mt	81.7	83.2	83.7	92.4	1.7	0.7	10.4
Consumption								
Primary aluminium	kt	207	165	181	177	-20.5	9.9	-1.9
Exports								
Primary aluminium	kt	1,442	1,353	1,407	1,395	-6.2	4.0	-0.8
– nominal value	A\$m	3,241	3,202	3,593	3,314	-1.2	12.2	-7.8
– real value e	A\$m	3,298	3,202	3,518	3,174	-2.9	9.9	-9.8
Alumina	kt	17,676	17,938	18,120	18,265	1.5	1.0	0.8
– nominal value	A\$m	5,995	6,286	6,066	6,103	4.8	-3.5	0.6
– real value e	A\$m	6,100	6,286	5,939	5,846	3.0	-5.5	-1.6
Bauxite	Kt	20,971	23,807	23,339	27,813	13.5	-2.0	19.2
– nominal value	A\$m	992	994	940	1,020	0.2	-5.4	8.4
– real value e	A\$m	1,009	994	921	977	-1.5	-7.4	6.1
Total value								
– nominal	A\$m	10,228	10,482	10,600	10,436	2.5	1.1	-1.5
– real e	A\$m	10,407	10,482	10,377	9,997	0.7	-1.0	-3.7

Notes: **b** Producer and LME stocks; **c** LME cash prices for primary aluminium; **d** In 2017 calendar year US dollars; **e** In 2016-17 financial year Australian dollars; **f** Forecast; **s** Estimate

Source: ABS (2017) International Trade in Goods and Services , 5368.0; AME Group (2017); LME (2017); Department of Industry, Innovation and Science (2017); International Aluminium Institute (2017); World Bureau of Metal Statistics (2017)